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ABSTRACT

The product mortality and data regarding cigarette smoking from the United States Census were used to calculate cause-deleted life tables that permit separation of competing risks of major changes in mortality. An analysis of competing risks consists of decomposition of the life table probability of surviving from one specific age to another specific age into component terms estimated from total deaths and deaths from the specific cause. The product equality allows interpretation of each of the specific cause terms as the probability of surviving the specific cause independent of other causes. The overall probability becomes the product of probabilities of surviving all the risks together. Calculations based upon public health data and cause deletion indicate increases in life expectancy due to cigarette smoking cessation of 2.0046 years for males and 1.5606 years for females. (Author/CB)

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THE UTILIZATION OF CAUSE-DELETED LIFE TABLES TO CALCULATE LONGEVITY DATA RELATIVE TO CIGARETTE SMOKING CESSATION

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INTRODUCTION

On May 20, 1984, C. Everette Koop, Surgeon General of the U.S. in a lecture to the American Lung Association stated, "I believe that the ultimate goal should be a smoke-free society by the year 2000." In order to back up his contention, he used public health data from 1982 that linked 129,000 cancer deaths and 170,000 deaths from coronary heart disease, directly to smoking. [1]

Health professionals have condemned smoking products for a time span in excess of 3 decades! In response, Americans are reducing their smoking behaviors. In the 1950s, almost 50% of American males over the age of 18 smoked cigarettes; in 1980 the number is reduced to approximately 32%. [2] Although the number of young females appear to have been on the increase in recent years, the overall proportion of female smoking behaviors have also decreased! [3]

With the increase of public health education regarding the effects of smoking and recent legal sanctions against smoking in specific public places, all evidence indicates that we wil continue to decrease smoking behaviors. Perhaps Koop's desire for a smoke-free society may some day become a reality.

The thought of a smoke-free society raises some questions regarding the decrease in pathology and the resulting increase in population longevity particularly as they relate to current population projections.

METHODS

Approximately 53 million people are willing victims of one of the most destructive substances in the environment--cigarette smoke. There are 3 major causes of death related to cigarette smoking: malignant neoplasm, major cardiovascular disease and chronic obstructive pulmonary disease. Combined, these causes, account for approximately 73.4% of all deaths in the U.S. [Figure 1; Table 1] [4] It is estimated that approximately 25% of neoplastic deaths, 30% of cardiovascular deaths and 90% of COPD deaths are related to cigarette smoking. [Figure 2; Table 1] [5-8]

The proportion of mortality documented in the professional literature related to cigarette smoking was extrapolated from the vital statistics data by age group and gender. The product mortality and data from the US Census were utilized to calculate cause-deleted life tables which permit separation of competing effects of major changes in mortality. An analysis of competing risks consists of decomposition of the nPx, the life table probability of surviving from age x to x+n, into component terms estimated from total deaths and deaths for the specific cause. The product equality allows interpretation of each of the nPx[specific cause] terms as the probability of surviving the specific cause independent of other causes. The overall probability [nPx] becomes the product of the probabilities of surviving all the risks together.

EXAMPLE: F*[-j]= life expectancy from age x to user-preset lifespan limit if cause of deaths was eliminated but other causes remain as before. This is calculated by decomposing nPx, and recalculating the new probability of survival of survival cause deleted. The probability of surviving from ages 50-55 in 1980 was .93. Of the deaths in this interval [104,187], 18,664 were cigarette related deaths from cardiovascular disease, cancer or COPD or 18%. Thus, 5OP55,neo,cardio,copd= $.93^{.18}$=.987. Cause deletion is calculated by resetting the survival rate to 1.0. When this is done through each age interval, life expectancy is recalculated based on deletion of cause[s]. This product F*[-j] can be compared to the original life expectancy and the discrepancy is equal to the average longevity increase.

RESULTS

Calculations based upon public health data and cause deletion indicate increases in life expecancy due to smoking cessation of 2.0046 years for males and 1.5606 years for females.

TABLE 1--MORTALITY DATA-US (1980)

Cause of Deaths	Total Deaths Cause Specific	Deaths Due Due to Smoking
Total	1,989,841	451,135
CVD	988,545	296,563
Neoplasms	416,509	104,127
COPD	56,050	50,445

REFERENCES

1. U.S. Department of Health and Human Services: The Health Consequences of Smoking, A Report of the Surgeon General, 1983.

2. Sorochan, Walter D. Promoting Your Health, John Wiley & Sons, 1981, p. 226.

3. American Cancer Society. Cancer Prelvention Study II: An Epidemiological Study of Lifestyles and Environment, 4(1), Spring, 1986, p. 3.

4. U.S. Vital Statistics, Part II-Mortality, 1980.

5. Schwartz, Allan M. Update on the Effects of Smoking-1981, The Journal of the American Osteopathic Association, 81(5), 1982, pp. 638-643.

6. Vlietstra, Ronald E, etal. Effect of Cigarette Smoking on Survival of Patients with Angiographically Documented Coronary Artery Disease, The Journal of the American Medical Association, 225(8), 1986, pp. 1023-1027.

7. U.S. Department of Health and Human Services. The Health Consequences of Smoking 'Cardiovascular Diseases' A report of the Surgeon General, 1983.

8. U.S. Department of Health and Human Services. The Health Consequences of Smoking 'Chronic Obstructive Lung Disease' A report of the Surgeon General, 1984.

9. Vial, Wayne C. Southwestern Internal Medical Conference: Cigarette Smoking and Lung Disease. The American Journal of Medical Science, 291(2), 1986.